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Forest Statistics

for the

Eastern Shore of Maryland

Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
Ralph W. Marquis, Director

1954

United States Department of Agriculture • Forest Service

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Forest Statistics Series: Maryland No. 3

FOREWORD

This is the third and final preliminary report about forest areas and timber volumes in the State of Maryland. It is a product of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the nationwide forest survey being made by the Forest Service, U. S. Department of Agriculture.

Similar reports have been prepared for Western Maryland and Central Maryland.

The Maryland Department of State Forests and Parks, Department of Research and Education, and Department of Game and Inland Fish supplied the aerial photographs used. The Department of Research and Education provided half the field personnel and cooperated in many other phases of the survey.

Field work on the Eastern Shore of Maryland was supervised by Harry W. Camp, Jr. C. Allen Bickford developed the statistical procedures used. Computations were made under the supervision of Roland H. Ferguson.

Ralph W. Marquis

Ralph W. Marquis
Director

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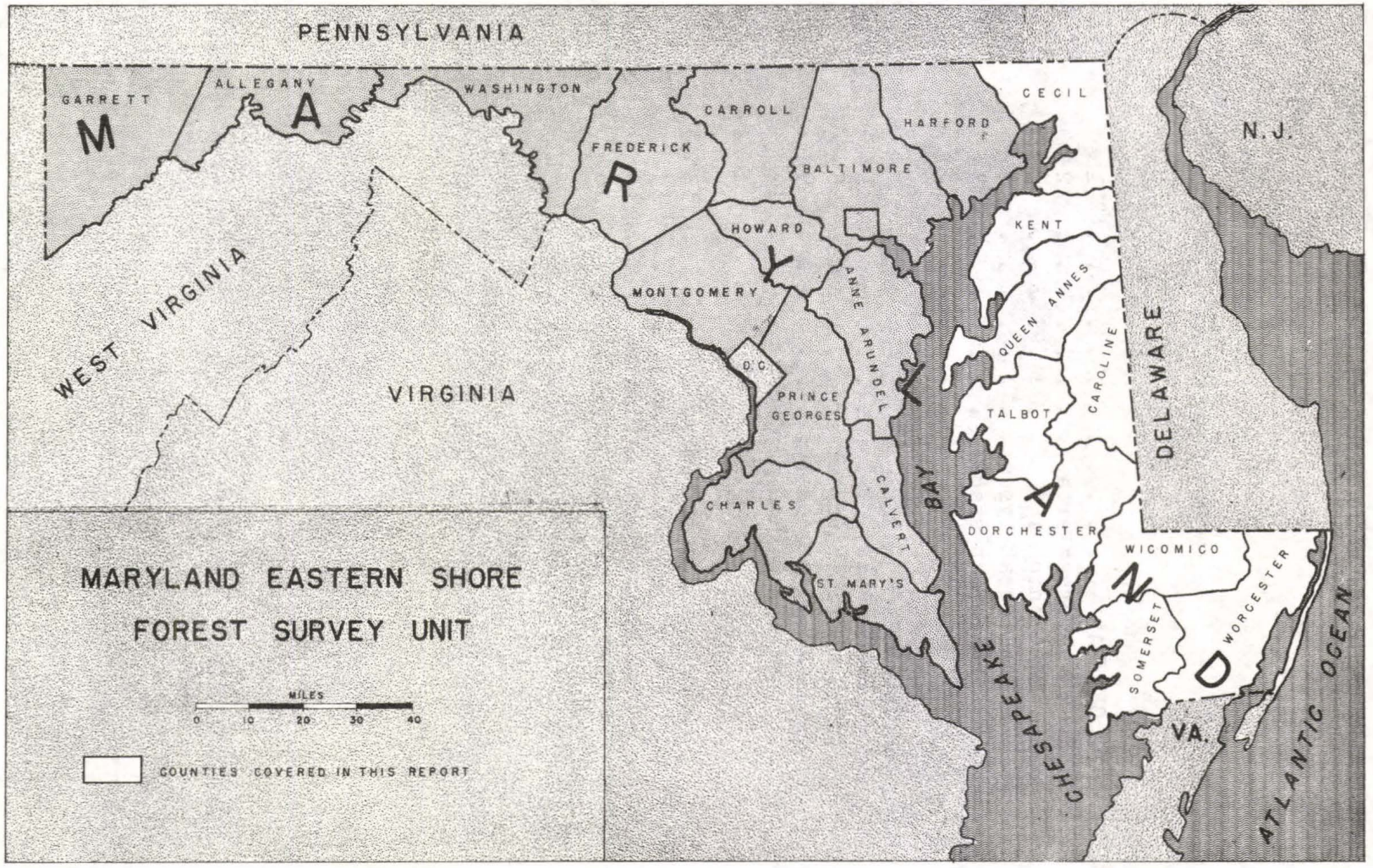
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FOREST STATISTICS

FOR THE

EASTERN SHORE OF MARYLAND

Prepared by

Division of Forest Economics

Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

GENERAL

THE EASTERN SHORE of Maryland includes the nine counties situated east of Chesapeake Bay. From north to south these counties are Cecil, Kent, Queen Annes, Caroline, Talbot, Dorchester, Wicomico, Worcester, and Somerset.

Approximately 95 percent of the area is drained by minor streams that flow directly into Chesapeake Bay. The remainder lies in the Lower Susquehanna River watershed and in the Delaware River watershed.

Nearly the entire Eastern Shore is in the Coastal Plain--the only exception being the northern part of Cecil County, which is in the Piedmont Plateau. Since this plateau area constitutes less than 5 percent of the total, no separation of data has been made.

The topography of the Eastern Shore is much flatter than that of the Coastal Plain area west of Chesapeake Bay. In very few places here does the elevation reach 100 feet, and a majority of the area is less than 50 feet above sea level. There are extensive marshes and swamps adjacent to the bay and streams.

Farming, forestry, and fishing are of primary importance in the area. Farming activities embrace vegetable growing, poultry production, and some dairying. The crab and oyster industry, while not so active as in past years, is still one of the major enterprises. The harvesting of poles and piling and the production of lumber are also important to the economy of the area.

The Forest Area

The Eastern Shore of Maryland has a total land area of slightly more than 2 million acres. Commercial forest land amounts to 882,500 acres, or 41 percent of the total. In addition there are 2,100 acres reserved from timber cutting, and 2,500 acres of unproductive forest land.

The four southernmost counties--Dorchester, Wicomico, Somerset, and Worcester--are the most heavily forested. These counties average 48 percent commercial forest land as compared to 33 percent for the other five counties.

Ownership

Private ownership accounts for 98 percent of the commercial forest land, and this is divided almost equally between farm forests and other private holdings. The remaining 2 percent is publicly owned, mostly by the State of Maryland.

The Forest Types

Loblolly pine is the most extensive forest type on the Eastern Shore. This type occupies 31 percent of the commercial forest area (table 4). It is widespread from the southern part of Kent County southward. Loblolly pine-hardwood and other softwood types occur on another 14 percent.

The most extensive single hardwood type is bottomland hardwood, which occupies 18 percent of the commercial forest land. This is followed by white oak, 11 percent; hardwood-

loblolly pine, 11 percent; red oak, 10 percent; and other hardwood types, 5 percent.

The bottomland hardwood type is found in areas of swamp land and other poorly drained sites. The white oak type occurs on similar sites, and differs little in composition other than containing a higher proportion of white oak.

The Forest Stands

Sawtimber stands are found on 51 percent of the commercial forest area. Poletimber stands occupy 35 percent, while seedling-and-sapling stands and other cover occupy the remaining 14 percent.

Nearly half of the sawlog volume is in sawtimber stands of more than 5,000 board feet per acre. These stands occupy only 16 percent of the commercial forest area.

The pine stands are being heavily cut. Pressure on the hardwood stands is considerably lighter.

Timber Volume

The commercial forests on the Eastern Shore contain 2 billion board feet (log scale, International $\frac{1}{4}$-inch rule) of sawtimber (tables 6-9). Softwoods make up 48 percent of this volume, with loblolly pine alone accounting for 45 percent. Red and white oak make up 20 percent and sweetgum 12 percent. Several other hardwoods, including yellow-poplar, blackgum, and red maple, combine to account for the remaining 20 percent.

Total growing stock amounts to 886 million cubic feet. Of this, 529 million cubic feet are in sawtimber trees and 357 million cubic feet are in poletimber trees.

This cubic volume is the equivalent of slightly more than 11 million standard cords, including bark. Three-fourths of it is in trees less than 15 inches in diameter at breast height.

Table 1.--Land area in Eastern Shore Maryland, by major classes of forest land, 1950

Class of land[1]	Area	
	Acres	Percent
Forest land:		
Commercial	882,500	41
Noncommercial[2]	4,600	(3/)
All forest land	887,100	41
Nonforest land	1,278,000	59
All land[4]	2,165,100	100

[1]See Appendix for definitions.

[2]Includes 1,200 acres in the Blackwater National Wildlife Refuge and 900 acres in the Elk Neck State Park, both areas reserved from timber cutting. Also includes 2,500 acres of unproductive forest land.

[3]Less than 1 percent.

[4]From Census of Agriculture, 1950. Water areas of 1 to 40 acres are included in the estimate of nonforest acreage.

Table 2.--Land area and commercial forest-land area in Eastern Shore Maryland, by county, 1950

County	Land area	Commercial forest-land area	
	Acres	Acres	Percent
Cecil	225,300	84,800	38
Kent	181,700	42,900	24
Queen Annes	238,700	78,000	33
Caroline	204,800	84,800	41
Talbot	178,600	47,200	26
Dorchester	371,200	160,300	43
Wicomico	243,200	129,400	53
Somerset	212,500	92,000	43
Worcester	309,100	163,100	53
Total	2,165,100	882,500	41

Table 3.--Commercial forest-land area in Eastern Shore Maryland, by ownership, 1950

Ownership class	Acreage held	
	Acres	Percent
Private:		
Farm forest land[1]	434,500	49
Other private	428,000	49
Total private	862,500	98
Public:		
State[2]	18,700	2
Federal	1,300	(3/)
Total public	20,000	2
All ownerships	882,500	100

[1]Census of Agriculture, 1950

[2]Includes 2,500 acres administered by the Department of Fish and Game and 16,200 acres administered by the Department of Forests and Parks.

[3]Less than 1 percent.

Table 4.--Commercial forest-land area in Eastern Shore Maryland, by forest type, 1950

Forest type	Area	
	Acres	Percent
Loblolly pine	278,400	31
Loblolly pine-hardwood	77,900	9
Other softwood types[1]	41,700	5
Bottomland hardwood	159,000	18
White oak	100,000	11
Hardwood-loblolly pine	93,800	11
Red oak	87,500	10
Other hardwood types[2]	44,200	5
All types	882,500	100

[1]Includes pitch pine-Virginia pine and hard pine-oak types.

[2]Includes chestnut oak, oak-hard pine, and sweetgum--yellow poplar types.

Table 5.--Commercial forest-land area in Eastern Shore Maryland, by stand-size class and forest-type group, 1950

Forest-type group	Sawtimber stands		Poletimber stands		Seedling-and-sapling stands and other areas	Total
	More than 5,000 bd.ft. per acre	1,500-5,000 bd.ft. per acre	More than 600 cu.ft. per acre	200-600 cu.ft. per acre		
	Acres	Acres	Acres	Acres	Acres	Acres
Loblolly pine	67,900	106,800	59,500	18,500	25,700	278,400
Other softwood types	8,700	42,900	19,700	34,400	13,900	119,600
Oak types	25,500	63,200	20,300	54,800	23,700	187,500
Other hardwood types	37,200	100,900	55,900	40,600	62,400	297,000
All types	139,300	313,800	155,400	148,300	125,700	882,500
Percent	16	35	18	17	14	100

Table 6.--Net volume of live timber on commercial forest land in Eastern Shore Maryland, by species, 1950

Species	Growing stock[1]		Sawtimber[2]
	Thousand cu.ft.	Equivalent in cords	Thousand bd.ft.
Loblolly pine	390,100	4,876,300	927,200
Pitch pine	14,400	180,000	34,000
Virginia pine	40,800	510,000	26,700
Other softwoods	4,900	61,200	9,300
All softwoods	450,200	5,627,500	997,200
Red oak	101,500	1,268,800	249,800
Sweetgum	88,400	1,105,000	245,100
White oak	79,400	992,500	160,700
Yellow-poplar	22,400	280,000	97,900
Blackgum	31,000	387,500	89,300
Red maple	52,300	653,800	80,700
Beech	12,800	160,000	38,100
Ash	8,800	110,000	19,400
Chestnut oak	9,300	116,200	18,200
Other hardwoods[3]	29,500	368,700	70,600
All hardwoods	435,400	5,442,500	1,069,800
All species[4]	885,600	11,070,000	2,067,000

[1]Cord equivalent is in rough standard cords assumed to average 80 cubic feet of peeled wood.

[2]Log scale, International $\frac{1}{4}$-inch rule.

[3]Excludes 500,000 cubic feet or 6,250 cords of so-called noncommercial species such as hophornbeam.

[4]Excludes the net volume of cull trees--4,300,000 cubic feet.

Table 7.--Net volume of live timber on commercial forest land in Eastern Shore Maryland, by diameter class, 1950

Diameter class[1] (inches at breast height)	Growing stock	Saw-timber
	Thousand cu.ft.	Thousand bd.ft.
Softwoods:		
6	67,000	--
8	83,300	--
10	82,500	189,300
12	82,200	252,400
14	58,700	225,100
16	36,100	145,800
18	20,300	91,300
20	14,200	64,500
22 and more	5,900	28,800
All softwoods	450,200	997,200
Hardwoods:		
6	61,400	--
8	72,200	--
10	73,200	--
12	53,800	198,400
14	51,300	223,000
16	40,900	203,900
18	27,200	135,300
20	13,900	75,400
22	18,700	104,500
24	5,800	32,800
26 and more	17,000	96,500
All hardwoods	435,400	1,069,800
Total	885,600	2,067,000

[1]The midpoint of each 2-inch diameter class is indicated.

Table 8.--Net volume of live timber on commercial forest land in Eastern Shore Maryland, by forest type, 1950

Forest type	Growing stock		Saw-timber
	Thousand cu.ft.	Equivalent in cords	Thousand bd.ft.
Loblolly pine	401,800	5,022,500	844,600
Loblolly pine-hardwood	71,600	895,000	160,400
Other softwood types	36,900	461,200	38,400
Bottomland hardwood	182,400	2,280,000	526,100
White oak	46,100	576,300	92,300
Hardwood-loblolly pine	27,700	346,200	52,000
Red oak	74,200	927,500	245,700
Other hardwood types	44,900	561,300	107,500
All types	885,600	11,070,000	2,067,000

Table 9.--Average net volume of live timber per acre of commercial forest land in Eastern Shore Maryland, by stand-size class, 1950

Stand-size class (and acreage of each class)	Growing stock	Sawtimber
	Cubic feet	Board feet
Sawtimber stands:		
More than 5,000 bd.ft. per acre (139,300 acres)	2,100	7,160
1,500-5,000 bd.ft. per acre (313,800 acres)	1,200	2,910
Poletimber stands:		
More than 600 cu.ft. per acre (155,400 acres)	980	580
200-600 cu.ft. per acre (148,300 acres)	340	380
Other stands[1] (125,700 acres)	60	90
Average, all stand-size classes[2] (882,500 acres)	1,000	2,340

[1]Includes seedling-and-sapling stands and other areas.

[2]Hardwoods constitute 52 percent of the total board-foot volume, or 49 percent of the total cubic-foot volume, in the average stand-size class. The average cubic volume in all stand-size classes is equivalent to 12.5 cords per acre.

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide and abandoned fields and pastures not yet 10 percent stocked are excluded.)

Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions.

Forest Types

Forest types are classified according to the species, or species group, that makes up the major portion of the stand in terms of cubic feet in sawtimber and poletimber stands or number of stems in seedling-and-sapling stands.

Stand-Size Classes

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$-inch rule.

Poletimber stands.--Stands that fail to meet the sawtimber stand specification, but are at least 10 percent stocked with poletimber and larger (5.0 inches and larger) trees, and with at least half the minimum volume in poletimber trees. (Poletimber stands carry at least 200 cubic feet per acre)

Seedling-and-sapling stands.--Stands not qualifying as either sawtimber or poletimber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling-and-sapling trees.

Other areas.--Forest land areas not qualifying as sawtimber, poletimber, or seedling-and-sapling stands. (Includes nonstocked areas.)

Tree Classes

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and which are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate net volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6.0 inches in diameter, inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8.0 inches in diameter inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timbers, or ties.)

Poletimber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for sawtimber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make sawtimber trees eventually.)

Seedling-and-sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

(This volume is also given in rough standard cords, bark included. Cord volume is derived from growing stock by applying a factor of 80 cubic feet per cord.)

Live sawtimber volume.--Net volume in board feet, International $\frac{1}{4}$-inch rule, of live sawtimber trees.

FOREST SURVEY METHODS

These forest statistics for the Eastern Shore of Maryland are based on information gathered from aerial photographs and from sample plots.

The photo-interpretation plots were distributed uniformly by mechanical means over the entire area. Trained photo-interpreters then classified each of these plots as either forest or nonforest. If forest, they were further classified according to stand size and forest type.

Enough sample plots to attain a specified level of accuracy were then selected randomly and were inspected by field crews. Species and volume data were collected on these ground plots; and the photo classification of stand size and forest type was verified and--if necessary--changed.

The survey was designed for maximum accuracy in the estimate of total merchantable cubic volume.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error. First, photo-interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. We can measure the size of this sampling error. In Eastern Shore Maryland the probabilities are 2 out of 3 that the actual forest area is within ± 2.3 percent of the estimated forest area, that the actual cubic-foot volume is within ± 4.3 percent of the estimated cubic-foot volume, and that the actual board-foot volume is within ± 6.0 percent of the estimated board-foot volume. This does not include any mistakes in measurement or classification.

These percentages show that the area estimates are more accurate than the volume estimates, and that the cubic-foot estimates are more accurate than the board-foot estimates.

In each of the tables, the total figures are more accurate than the subtotals. The subtotals are more accurate than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in the Eastern Shore of Maryland are listed below.[1] Approved common names are shown in parentheses if these differ from the brief name used in the tables. Other tree species may occur in the area, but unless they were tallied on the field plots they were not included in the following list.

Softwoods

Loblolly pine	- Pinus taeda
Pitch pine	- Pinus rigida
Virginia pine	- Pinus virginiana
Other softwoods	
(Shortleaf pine)	- Pinus echinata
(Atlantic white-cedar)	- Chamaecyparis thyoides
(Eastern redcedar)	- Juniperus virginiana

[1] U.S. Forest Service. Check list of the native and naturalized trees of the United States including Alaska. 325 pp. 1949.

Hardwoods

Red oak (Northern red oak)	- Quercus borealis
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
(Pin oak)	- Quercus palustris
(Southern red oak)	- Quercus falcata
(Water oak)	- Quercus nigra
(Willow oak)	- Quercus phellos
Sweetgum	- Liquidambar styraciflua
White oak (White oak)	- Quercus alba
(Swamp white oak)	- Quercus bicolor
(Overcup oak)	- Quercus lyrata
(Post oak)	- Quercus stellata
Yellow-poplar	- Liriodendron tulipifera
Blackgum	- Nyssa sylvatica
Red maple (Red maple)	- Acer rubrum
(Silver maple)	- Acer saccharinum
Beech (American beech)	- Fagus grandifolia
Ash	- Fraxinus species
Chestnut oak	- Quercus montana
Other hardwoods	
(Yellow birch)	- Betula lutea
(River birch)	- Betula nigra
(Black cherry)	- Prunus serotina
(Hickory)	- Carya species
(Elm)	- Ulmus species
(Black walnut)	- Juglans nigra
(Black locust)	- Robinia pseudoacacia
(Sycamore)	- Platanus occidentalis
(American holly)	- Ilex opaca

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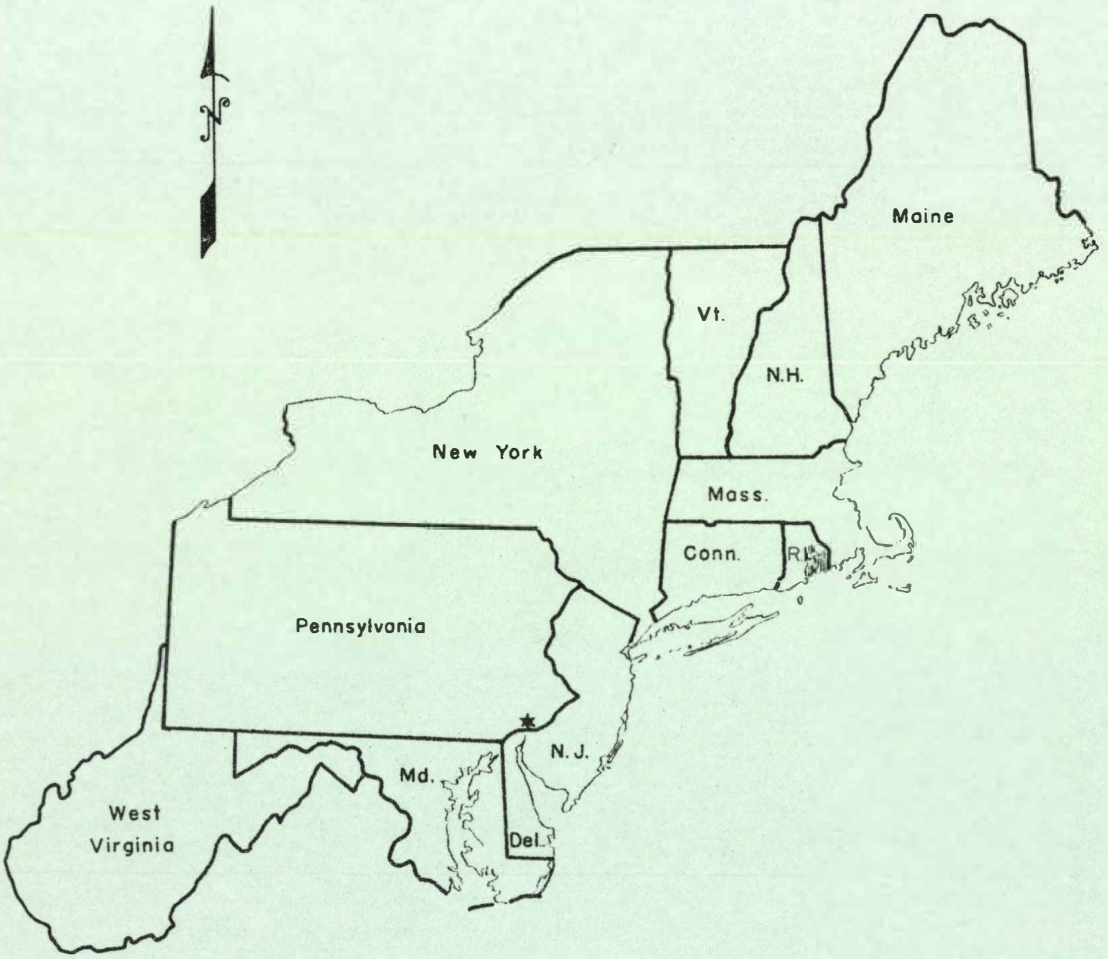

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